REMARKS

By the above actions, the specification and claim 1 have been amended. In view of these actions and the following remarks, further consideration of this application is requested.

With regard to the above amendment to the specification, it is noted that this has been done to correct an obvious typographical error and to conform this aspect of the description with the correct value set forth in claim 1.

Claims 1-4 have now been rejected under 35 U.S.C. § 103(a), as being obvious in view of the teachings of the Nagayama ('123) patent in view of the PCT publication to Torikai et al., which has matured into U.S. Patent No. 6,320,314. However, this rejection is inappropriate, at least insofar as it relates to the claims as now presented, for the following reasons.

Firstly, it is pointed out that, in the present invention as defined by claim 1, the lead bar (11) is attached to the conductive end of the functionally gradient material. Furthermore, as described, e.g., in the paragraph spanning pages 5 & 6 of the specification and as is now recited in amended claim 1,

> a cylindrical gap is located between the lead bar and the functionally gradient material, said cylindrical gap being formed within the functionally gradient material by an enlargement of the inside diameter of the insertion hole which extends from a point of attachment of the lead bar to the functionally gradient material to the non-conductive end of the functionally gradient material.

The gap (24) spanning the region marked L in Figure 1 is described in the first two full paragraphs of page 8 as serving the important function of preventing cracking. For example, as set forth at lines 12 & 13 of page 8, due to the presence of the gap, there is "no danger of cracking because of contact between the lead bar 25 and the part of the functionally gradient material 21 with a high proportion of the non-conductive component." The problem of cracking during the post-sintering cooling phase is described in the paragraph spanning pages 1 & 2, as well as the first paragraph of page 2, of the present application, and is a problem to which the present invention is directed as a solution.

Contrary to the present invention, as acknowledged by the Examiner, the Nagayama reference fails to disclose the use of silica glass as nonconductive material (the conductive material of the functionally gradient material is the same material (tungsten) as that of the

electrode lead rod), molybdenum as the conductive material or applicants' proportion of conductive material in the functionally gradient material at the point of attachment of the lead bar to the functionally gradient material. Furthermore, significantly, the lead bar of Nagayama is attached to the functionally gradient material be being threaded into an internal threaded surface 309 of the outermost layer and then is fixed and sealed with platinum solder 307 (see, first full paragraph, col. 25). The tapping of the threads in the end cap 309 and attachment of the lead rod 304 does not occur until after "an integral body of the light-transmissive bulb 301 and the end cap 303" has been formed. Thus, in addition to teaching different structure from that disclosed and claimed in the present application (i.e., different nonconductive material, alumina vs silica, different conductive material, tungsten vs. molybdenum, and different mode of attachment, threading vs. sintering), Nagayama is, moreover, not directed to solving the problem noted above and cannot suggest a solution thereto, let alone applicant's solution.

As for the Torikai et al. reference, it too discloses an arrangement which is structurally very different from both the present application and the sealing structure of the Nagayama patent. Unlike the present invention, the lead bar (upholding part 4) does not extend through the functionally gradient material but rather its outer end terminates within the sintered body, the electrical connection being made through the conductive outer layers. Thus, the upholding part 4 is inserted and sintered within an opening provided in the layers that are high in nonconductive material (silicon dioxide; see, col. 3, lines 24-26), and of course, no gap is provide between the upholding part and the functionally gradient material layers through which it passes. Still further, the d/D ratio of 0.12 to 0.6 of claim 2 is not present. Relative to Nagayama, Torikai et al. mount their functionally gradient material within the sealing bodies 7, not onto the end faces of a bulb having no equivalent bodies; and like the present invention, uses different materials for the functionally gradient material from that of Nagayama and attaches the lead bar/upholding part via sintering instead of threading.

Thus, while it does not appear reasonable that one of ordinary skill in the art to modify the Nagayama structure based on the disclosure of the Torikai et al. reference, it is submitted that any appropriate combination of their teachings would not lead to the present invention in the manner of the Examiner's hindsight reconstruction of the present invention.

That is, why would one change the materials taught by Nagayama to those of Torikai et al. without also changing the manner of attachment? Yet, if the manner of attachment, threading, were changed to sintering, the teaching of Torikai et al. is not to have the lead bar pass through the functionally gradient material and to produce the affixation therebetween in layers that are nonconductive and without a gap. Furthermore, Torikai et al. teach materials and an method of production for installation within sealing bodies that project from the bulb while Nagayama teaches materials and a method of production for external affixation directly to a bulb having no sealing bodies. Why would anyone assume that functionally gradient materials and a manner of attaching lead bars thereto in one case would apply to the other, let alone to pick and choose aspects of each to reach an arrangement taught by neither reference and found only in the present applicants' disclosure?

Therefore, the rejection of the claims 1-4, under § 103(a), based upon Nagayama alone or in combination with Torkai et al. is totally without merit and should be withdrawn, such action now being requested.

While the present application is now believed to be in condition for allowance, should the Examiner find some issue to remain unresolved, or should any new issues arise, which could be eliminated through discussions with Applicants' representative, then the Examiner is invited to contact the undersigned by telephone in order that the further prosecution of this application can thereby be expedited.

Lastly, it is noted that a separate Extension of Time Petition accompanies this response along with a check in payment of the requisite extension of time fee. However, should that petition become separated from this Amendment, then this Amendment should be construed as containing such a petition. Likewise, any overage or shortage in the required payment should be applied to Deposit Account No. 19-2380 (740145-148).

Respectfully submitted,

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